P.O. Box 52025
Phoenix, AZ 85072-2025
(602) 236-5900

Case # 08-10

DATE: February 6, 2008

TO: MAG Specifications and Details Committee Members

FROM: Peter Kandaris, SRP Representative

RE: **Modifications Detail 200, Section 336 & Section 601: Trench Backfill and Pavement Replacement**

The attached detail and specification section revisions are proposed to reduce numerous agency exceptions to MAG trench backfill and pavement replacement standards (as requested by the MAG Standards & Details Consolidation Subcommittee).

A review of MAG agency supplemental details and specifications notes that nearly every entity takes some form of exception to standard utility trench backfill and pavement replacement requirements. A number of the exceptions tend to follow similar patterns and have been incorporated into the proposed modifications.

Detail 200 has been completely re-done. A summary document outlining the changes is also included as a “road map” to show items added, deleted or modified from the present detail. Modifications to Section 336 and 601 are also included to make changes more consistent and reduce duplication between the detail and the specification sections.

An evaluation of the various agency trench backfill and pavement replacement supplements was also performed. Changes with the MAG documents will require each agency to modify their standards to insure that supplemental details are removed. Suggested changed to each agency’s supplements are provided to facilitate the process. Some agencies supplemental specifications will need only minor changes while others will need extensive revisions to retain repair preferences.

There was no attempt to make uniform the variations with asphalt pavement sections and material types used by different agencies. At present, these variations show a wide difference in engineering approach to pavement replacement. A table is attached that highlights the different approaches. It is recommended that this aspect of trench work be postponed to next year and that discussions be held over the next few months to come up with a more uniform engineering approach prior to proposing revised standards.

Summary of Changes to MAG Detail 200

Type A

- Recommended for longitudinal cuts
- Allows option of CLSM along with ABC for base
- AC section to be specified by special provisions or plans
- AC base and surface courses separately identified
- Includes new requirement for removal of 24" remnant between cut and curb
- References trench width to Sections 336 & 601

Type B (now referenced as "Type B Modified")

- Includes separate base – to match existing
- Allows backfill option of ABC, select & native along with CLSM
- References trench width to Sections 336 & 601
- 2" minimum AC thickness deleted. AC section to be specified by special provisions or plans
- AC base and surface courses separately identified

'T' Top (now referenced as "Type B")

- Recommended for transverse cuts
- Base shown separately. Allows option of CLSM along with ABC
- 1" minimum AC surface course deleted. AC section to be specified by special provisions or plans
- AC base and surface courses separately identified
- AC section to be specified by special provisions or plans
- Allows backfill options of select & native along with CLSM & ABC
- References trench width to Sections 336 & 601

Type C

- Edge sawcut included
- References trench width to Sections 336 & 601

Types D, E & F

- Combined into new Type D
- Recommended for trenches in ROW but not in paved roadway
- ABC base shown separately – to match existing if present instead of 9" per Note 4
- Defines backfill options to allow ABC, select, native or CLSM
- Surfacing to be specified by special provisions or plans – no minimums shown
- References trench width to Sections 336 & 601

New Type E

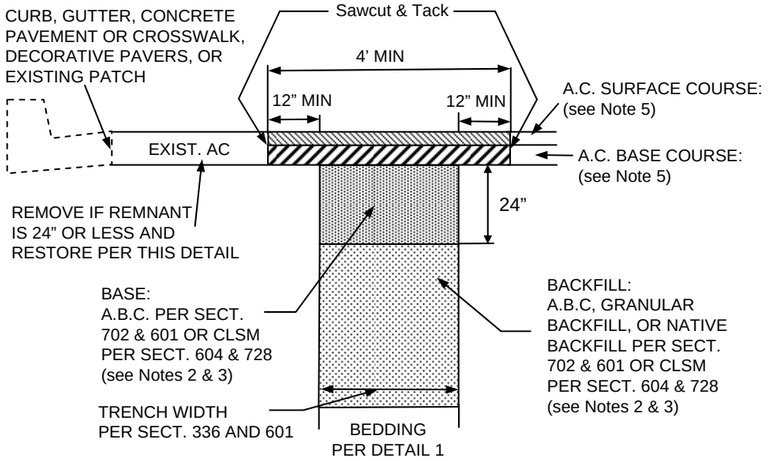
- Recommended for use in future roadway prism or alley
- Same as Type A, but with no pavement section

New Bedding Detail 1

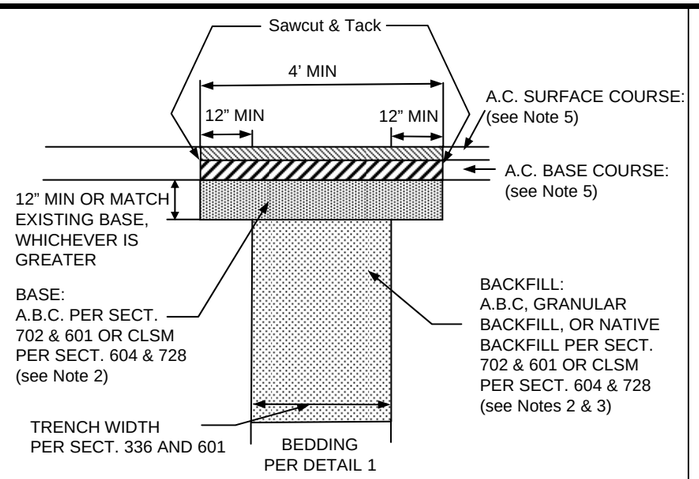
- Identifies minimum cover over utility
- Bedding per Sections 101.2 and 601 or per utility specifications

Notes

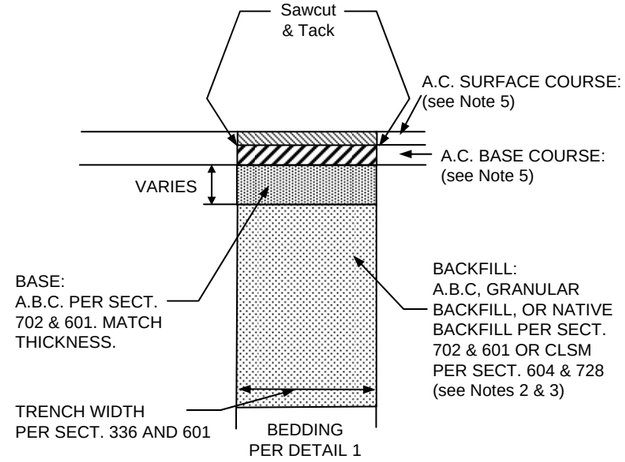
- Original Note 1 moved to new bedding detail.
- Original Note 2 → New Note 1: modified, and references Section 336 (not 321) where all of the material requirements are noted.
- Original Note 3 → New Note 3: minimum trench width for slurry backfill increased from 18” to 24”; only CLSM allowed with cement content specified in special provisions, plans or by the engineer.
- Original Note 4 moved to Type D detail with thickness changed from 9” to matching existing.
- Original Note 5 included in New Note 2.
- New Note 2 requires base and backfill to be specified in special provisions or plans.
- New Note 4 references base, backfill & bedding compaction requirements to Section 601.
- New Note 5 requires AC base and surface course to be specified in special provisions, plans or the default in Section 336.2.4.1.
- New Notes 6 & 7 gives a summary of requirements in first paragraph of Section 336.3 that were deleted.
- New Note 8 provides for protection of copper and PE water pipes in CLSM.



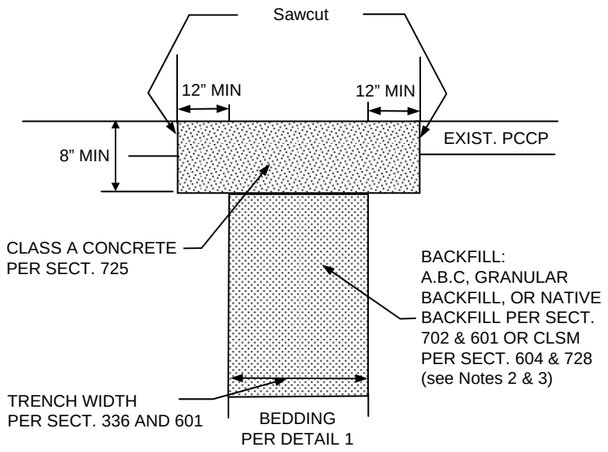
TYPE "A" LONGITUDINAL TRENCH
(trench in pavement parallel to traffic)



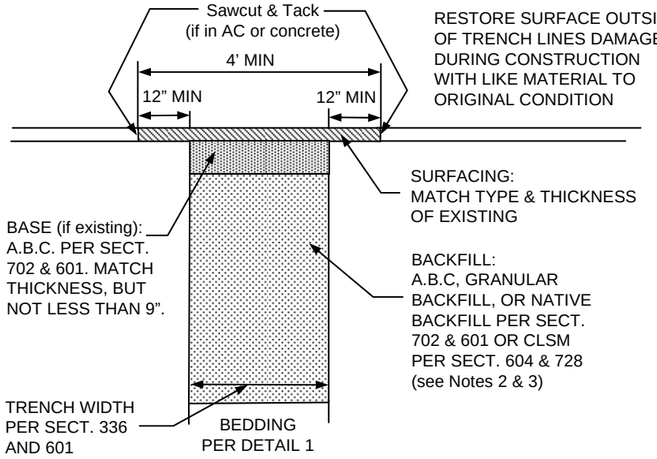
TYPE "B" TRANSVERSE TRENCH
(trench in pavement not parallel to traffic)



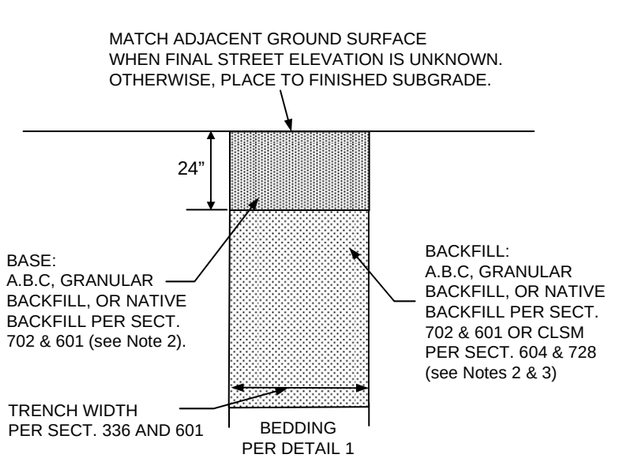
TYPE "B-MODIFIED"



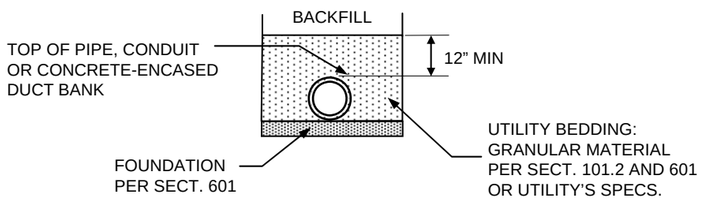
TYPE "C"
(trench in portland cement concrete pavement)



TYPE "D"
(trench in right-of-way but not in paved roadway)



TYPE "E"
(trench in future roadway prism or alley)



BEDDING DETAIL 1

NOTES:

1. PAVEMENT MATCHING AND SURFACE REPLACEMENT SHALL BE IN ACCORDANCE WITH SECTION 336.
2. TYPE OF BACKFILL AND BASE SHALL BE AS SPECIFIED BY THE SPECIAL PROVISIONS, PLANS OR ENGINEER.
3. TRENCHES LESS THAN 24" WIDE SHALL BE BACKFILLED FROM TOP OF BEDDING TO BOTTOM OF AC BASE COURSE OR ABC BASE (WHICHEVER IS APPLICABLE) WITH CLSM. CEMENT CONTENT SHALL BE SPECIFIED BY THE SPECIAL PROVISIONS, PLANS OR ENGINEER.
4. BASE, BACKFILL AND BEDDING COMPACTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 601.
5. A.C. BASE AND SURFACE COURSE TO BE AS SPECIFIED BY THE SPECIAL PROVISIONS, PLANS OR SECTION 336.2.4.1.
6. INCLUDE 12" WIDE BASE LIPS SHOWN IN TYPE "B" AT LONGITUDINAL TRENCH ENDS, EXCEPT WHERE THE EDGE ABUTS EXISTING CONCRETE.
7. USE TYPE "B" REPAIR WHENEVER A LONGITUDINAL TRENCH (TYPE "A") CROSSES A STREET OR GOES THROUGH AN INTERSECTION.
8. COPPER OR POLYETHYLENE WATER PIPES EXPOSED IN TRENCHES TO BE BACKFILLED WITH CLSM SHALL BE WRAPPED WITH MIN ¾" THICK CLOSED CELL FOAM INSULATION OR ¾" WIDE BLACK INSULATION BEFORE PLACING CLSM.

DETAIL NO.		STANDARD DETAIL		REVISED	DETAIL NO.
200	MARICOPA ASSOCIATION of GOVERNMENTS	ENGLISH	BACKFILL, PAVEMENT AND SURFACE REPLACEMENT	2/6/08 DRAFT	200

SECTION 336

PAVEMENT MATCHING AND SURFACING REPLACEMENT

336.1 DESCRIPTION:

Street and alley pavement and surfacing within the Contracting Agency's rights-of-way, removed by construction activities or to be widened or matched in connection with the improvement of Public Works, shall be placed as shown on the plans and applicable standard details, in accordance with this specification and/or the special provisions.

Asphalt concrete pavement replacement shall be constructed in accordance with Type A, B, ~~D or E~~ of ~~standard details,~~ as indicated on the plans, ~~and as required by Sections 321 and 710~~.

Portland cement concrete pavement replacement shall be in accordance with Type C of the Standard Details, and as required by Sections ~~505 and 725.~~ 324.

~~ABC or decomposed granite~~ surface replacement shall be constructed in accordance with Type ~~F of standard details~~ as indicated on the plans ~~and in Section 702~~.

Temporary pavement replacement shall be constructed as required ~~below~~.

Pavements to be matched by construction of new pavements adjacent to or at the ends of a project shall be saw cut in accordance with these specifications and where shown on the plans.

Pavement and surfacing replacement within ADOT rights-of-way shall be constructed in accordance with their permits and/or specification requirements.

336.2 MATERIALS AND CONSTRUCTION METHODS:

Materials and construction methods used in the replacement of pavement and surfacing shall conform to the requirements of all applicable standard details and specifications, latest revisions.

336.2.1 Pavement Widening or Extensions: Existing pavements which are to be matched by pavement widening or pavement extension shall be trimmed to a neat true line with straight vertical edges free from irregularities with a saw specifically designed for this purpose. The minimum depth of cut shall be 1 1/2 inches or D/4, whichever is greater.

The existing pavement shall be cut and trimmed after placement of required ABC and just prior to placement of asphalt concrete for pavement widening or extension, and the trimmed edges shall be painted with a light coating of asphalt cement or emulsified asphalt immediately prior to constructing the new abutting asphalt concrete pavements. No extra payment shall be provided for these items and all costs incurred in performing this work shall be incidental to the widening or pavement extension.

The exact point of matching, termination, and overlay may be adjusted in the field, if necessary, by the Engineer or designated representative.

336.2.2 Pavement to be Removed: Existing asphalt pavement to be removed for trenches or for other underground construction or repairs shall be cut by a device capable of making a neat, straight and smooth cut without damaging adjacent pavement that is not to be removed. The Engineer's decision as to the acceptability of the cutting device and manner of operation shall be final. If saw cutting, only, is to be utilized, it will be so specified in the plans or special provisions.

In lieu of cutting trenches across driveways, curbs and gutters, sidewalks, alley entrances, and other types of pavements, the Contractor may, when approved by the Engineer, elect to tunnel or bore under such structures and pavements.

When installations are within the street pavement and essentially parallel to the center line of the street, the Contractor, with approval of the Engineer, may elect to bore or tunnel all or a portion of the installation. In such installations, the seal coat requirements, as discussed in Section 336.2.4, will be modified as follows:

roadway

or B Modified

Standard Detail 200 and

in the Contracting Agency Special Provisions or

200

All other

in the right-of-way but not in paved roadways

D of Standard Detail 200 and

in the Contracting Agency Special Provisions or

herein

(A) If the pavement cuts (bore pits, recovery pits, etc.) are 300 feet or more apart, the bore or tunneled distance will not be considered as part of the open trench and the seal coat may not be required.

(B) If the pavement cuts (bore pits, recovery pits, etc.) are less than 300 feet apart, the distance between the cuts will be considered the same as a trench cut and the distance will be added to any trench cut distances.

336.2.3 Temporary Pavement Replacement: Temporary pavement replacement, as required in Section 601, may be with cold-mix asphalt concrete, with a minimum thickness of 2 inches, using aggregate grading in accordance with Section 710.

Temporary pavement replacement shall be used in lieu of immediate placement of single course permanent replacement or the first course of two course pavement replacement only on transverse lines such as spur connections to inlets, driveways, road crossings, etc., when required by the Engineer, by utilities or others who subcontract their permanent pavement replacement, under special prior arrangement; or for emergency conditions where it may be required by the Engineer. Temporary pavement replacement shall be placed during the same shift in which the backfill to be covered is completed.

Rolling of the temporary pavement replacement shall conform to the following:

(A) Initial or breakdown rolling shall be followed by rolling with a pneumatic-tired roller. Final compaction and finish rolling shall be done by means of a tandem power roller.

(B) On small areas or where equipment specified above is not available or is impractical, the Engineer will approve the use of small vibrating rollers or vibrating plate type compactors provided comparable compaction is obtained.

The surface of the temporary pavement shall be finished off flush with the adjacent pavement.

336.2.4 Permanent Pavement Replacement and Adjustments:

336.2.4.1 Permanent Pavement Replacement: Pavement replacement for cuts essentially parallel to the street centerline and greater than 50 feet in length shall be two course pavement replacement as hereinafter specified. For cuts greater than 600 feet in length the entire area shall then be seal coated in accordance with Section 330 (coated chips) or as otherwise specified. This seal coat shall extend from the edge of pavement or lip of gutter to the street centerline except that on residential streets less than 36 feet face to face of curb or where the pavement patch straddles the centerline, the entire width of street shall be seal coated.

In lieu of placing the seal coat as required previously, and with approval of the Contracting Agency, the Contractor may deposit with the Contracting Agency for credit to the Street Maintenance Department, a negotiated agreed upon amount. The Street Maintenance Department will incorporate this work into their street maintenance program.

Pavement replacement for cuts parallel to the street centerline less than 50 feet in length, transverse cuts, bell holes and similar small areas shall match gradation and thickness of the existing pavement. These one course pavement patches shall be compacted with a vibratory roller to the same density specified for asphalt concrete pavements.

Laying of single course or the base course of the asphalt concrete pavement replacement where a two course replacement is applicable shall never be more than 600 feet behind the ABC placed for the pavement replacement.

The trench must be compacted to its required density, and required ABC must be in place prior to the placement of the asphalt concrete.

Single course replacement shall consist of a 12.5 mm or 19 mm mix placed and finished as directed by the Engineer.

The base course of two course pavement replacement shall consist of a 19 mm mix in accordance with Section 710.

(336.2.4.1 rearranged – new text in green)

336.2.4.1 Permanent Pavement Replacement: Pavement replacement for longitudinal cuts (essentially parallel to the street centerline) greater than 50 feet in length and transverse cuts of any length shall be a two-course pavement replacement as specified in the Contracting Agency Special Provisions or on the plans. Pavement replacement for longitudinal cuts less than 50 feet in length, bell holes and similar small areas shall be a single course and match gradation and thickness of the existing pavement. These one-course pavement patches shall be compacted with a vibratory roller to the same density specified for asphalt concrete pavements.

If pavement replacement requirements are not noted on the plans or specified in the Contracting Agency Special Provisions, the following pavement replacement criteria will govern:

(A) Single coarse replacement shall consist of a 12.5 mm or 19 mm mix in accordance with Section 710, placed and finished as directed by the Engineer.

(B) The base course of a two-course pavement replacement shall consist of a 19 mm mix in accordance with Section 710.

(C) The surface course of a two-course pavement replacement shall consist of a 9.5 mm mix in accordance with Section 710 and as specified by the Engineer to match the existing surface. The surface course shall not be placed sooner than 2 weeks after the base course, except where the trench crosses a signalized intersection. In this case the surface course shall be placed within 48 hours, or the crossing pavement replacement shall be a single course as specified above.

(D) Where the base course is to be placed with non-compactive equipment, it shall be not less than 2 inches in thickness and the material shall be immediately rolled with a pneumatic-tired roller. The surface course shall be of sufficient depth to provide the total required compaction thickness of the two courses, but not more than 1 inch.

Where the base course is to be placed with non-compactive equipment, it shall be not less than 2 inches in thickness and the aterial shall be immediately rolled with a pneumatic-tired roller. The surface course shall be of sufficient depth to provide th total required compacted thickness of the two courses, but not more than 1 inch.

Where the trench is 6 feet or more in width, all courses, single or both courses of the two course pavement replacement, shall be laid with a self-propelled compacting, spreading equipment. When the trench is from 6 to 8 feet in width, the self-propelled compacting, spreading equipment shall not be wider than 8 feet. All courses, except the surface course, shall be of a compacted thickness of not less than 1 1/2 inches.

The surface course shall consist of a 9.5 mm mix in accordance with Section 710 as specified by the Engineer to match the existing surface. The surface course shall not be placed sooner than 2 weeks after the base course, except where the trench crosses a signalized intersection. In this case the surface course shall be placed within 48 hours, or the crossing pavement replacement shall be single course as specified above.

Placement of the surface course is to be by means which will result in a surface texture satisfactory to the Engineer, and flush with the existing pavement.

Where deep lift asphalt concrete (asphalt concrete base and asphalt concrete wearing course) exists, the base course replacement shall be made in lifts not exceeding 6 inches in compacted thickness to within 1/2 inch of the finish grade.

336.2.4.2 Adjustments: When new or existing manholes, values, survey monuments, clean outs, etc. fall within the limits of the permanent pavement replacement as discussed in this Section, the Contractor shall be responsible for adjusting the various items to the new pavement surface or as directed by the Engineer. This will include but not be limited to slurry and chip seals.

The Contractor will coordinate with the Engineer and with representatives of the various utilities regarding the adjustment and inspection of the work. The Contractor shall be responsible for obtaining and complying with all specifications, special requirements, details, etc. of the Utility Company regarding the adjustments. When adjusting the Agency's utilities, survey monuments, etc., the adjustment will comply with these Specifications and Details.

The work will be done in compliance with OSHA standards and regulations regarding confined space entry.

The Contractor shall remove all material attached to the lids and/or covers including that of prior work. The method of removal shall be approved by the Engineer and/or the Utility Representative.

336.3 TYPES AND LOCATIONS OF PAVEMENT AND SURFACING REPLACEMENT:

Normally, the type of pavement replacement and backfill required will be noted on the plans or specified in other portions of the contract documents and construction will be in accordance with Detail 200. ~~This detail requires that a 12 inches "T" Top be utilized when normal traffic flow is perpendicular to any one of the four sides of the trench excavation. Therefore, Type A pavement replacement will require a "T" Top whenever the trench crosses a street or goes through an intersection and at the end(s) if they terminate in the street. Type B pavement replacement will require the "T" Top on the sides that are perpendicular to normal traffic flow~~.

If a type is not noted on the plans or specified in the special provisions, the following criteria will govern:

Type A pavement replacement~~, including the "T" Top,~~ will be utilized on all streets where the excavation is parallel to the centerline of the street. Use type B pavement replacement whenever a longitudinal trench crosses a street or goes through an intersection.

Type B pavement replacement, ~~including the "T" Top,~~ will be utilized on all streets where the excavation is transverse to the centerline of the street.

Type C pavement replacement will be used to match existing portland cement concrete pavement.

Type D pavement replacement ~~may~~ be used when the condition of the existing pavement does not justify construction of Type A or B. Prior written approval of the Engineer is required. for this condition.

(E) Where the trench is 6 feet or more in width, all courses, single or both courses of the two-course pavement replacement, shall be placed with self-propelled spreading and compacting equipment. When the trench is from 6 to 8 feet in width, self-propelled spreading and compacting equipment shall not be wider than 8 feet. All courses, except the surface course, shall be of a compacted thickness of not less than 1 1/2 inches.

(F) Placement of the surface course is to be by means which will result in a surface texture satisfactory to the Engineer, and flush with the existing pavement.

(G) Where deep lift asphalt concrete (asphalt concrete base and asphalt concrete wearing course) exists, the base course replacement shall be made in lifts not to exceed 6 inches in compacted thickness to within 1/2 inch of the finish grade.

(H) The acceptable surface profile from the existing surface across a pavement replacement shall not vary more than ¼ inch from the lower edge of a 12-foot straightedge when the straightedge is placed parallel or perpendicular to the centerline of the roadway. When the width of the pavement replacement is greater than 6 feet, compliance with the specification shall be measured by placing the straightedge a minimum of 4 feet overlapping the existing pavement.

Laying of single course or the base course of the asphalt concrete pavement replacement where a two-course replacement is applicable shall never be more than 600 feet behind the ABC placement for the pavement replacement.

The trench must be compacted to its required density, and required ABC must be in place prior to the placement of the asphalt concrete.

For cuts greater than 600 feet in length the entire area shall then be seal coated in accordance with Section 330 (coated chips) or as otherwise specified. This seal coat shall extend form the edge of pavement or lip of gutter to the street centerline except that on residential streets less than 36 feet face-to-face of curb or where pavement patch straddles the centerline, the entire width of street shall be seal coated.

In lieu of placing the seal coat as required previously, and with approval of the Contracting Agency, the Contractor may deposit with the Contracting Agency for credit to the Street Maintenance Department, a negotiated agreed upon amount. The Street Maintenance Department will incorporate this work into their street maintenance program.

Placed in Notes 6 and 7 in Detail 200

essentially longitudinal or

or at an angle

will be utilized to repair asphalt concrete, portland concrete and aggregate surfaces in the right-of-way, but not in paved roadways. It may also

~~Type F pavement replacement will be utilized to match existing ABC or decomposed granite roadways.~~

Where a longitudinal trench is partly in pavement, the pavement shall be replaced to the outside edge of the existing pavement, on a straight line, as indicated on the plans. Measurements for payment shall be from the inner limit of pay width allowed below, to the outside edge of the existing pavement as defined herein.

Where no part of a trench is in pavement, surfacing replacement will only be specified where existing surfacing materials have been removed.

When a trench cut is in aggregate surfaced area, the surfacing replacement shall be of a like type and depth as the existing material, compacted to the densities required in Section 601.

336.4 MEASUREMENT:

Measurement for payment and surfacing replacement shall be by the square yard, based upon actual field measurement of the area covered except as noted below.

B Modified and E

(A) In computing pay quantities for replacement Types ~~A, B, and F~~, pay widths will be based on the actual field measured width, however the boundaries of the measurement will not extend further than 1/2 the distance, either side, from the centerline of the pipe as depicted on Table 601-1, Maximum Width At Top Of Pipe Greater Than O.D. Of Barrel.

A, B, C and D

(B) In computing pay quantities for replacement Types ~~C, D, E, and T~~, pay widths will be based on the actual field measured width, however the boundaries of the measurement will not extend further than 1/2 the distance plus 12 inches, either side, from the centerline of the pipe as depicted on Table 601-1, Maximum Width At Top Of Pipe Greater Than O.D. Of Barrel.

(C) Where a longitudinal trench is partly in pavement, computations of pay quantities shall be based on the limitations specified above.

(D) The length of pavement and surfacing replacement shall be measured through any manhole, valve box, or other structure constructed in the pipe line, and any pavement or surface replacement and/or seal treatment in excess of the above pay widths shall be considered and included in the bid item for such structure.

(E) Any pavement replacement in excess of the specified pay widths necessitated by the installation of valves, tapping sleeves and valves, valve by-passes, and concrete thrust blocks shall be included in the bid price for these items.

(F) When special provisions allow deviations from the trench widths specified in Section 601, the above allowed pay widths for pavement replacement may be altered where so specified.

(G) Measurement of pavement and surfacing replacement shall be made along the finished surface of the ground to the nearest foot, and shall be computed to the nearest square yard.

336.5 PAYMENT:

Direct payment for pavement or surfacing replacement will be made for replacement over all pipe trench cuts except as otherwise allowed in the special provisions. Payment for replacements over other work shall be included in the cost of constructing that work, in accordance with the applicable standard details and specifications.

Payment for temporary pavement replacement shall be included in the cost of the pipe.

When a Contractor has the option of either jacking and/or boring or opencut construction, and elects to construct a pipeline by the jacking and/or boring method, he will be paid for the replacement of such items of work as pavement, curb and gutter, sidewalk, driveway, and alley entrances, as allowed for opencut construction.

End of Section

The Contractor shall be entirely responsible for safeguarding and maintaining all conflicting utilities that are shown on the plans (Sections 107 and 105 apply). This includes overhead wires and cables and their supporting poles whether they are inside or outside of the open trench. If, in the course of work, a conflicting utility line that was not shown on the plans is discovered, the Contracting Agency will either negotiate with the owner for relocation, relocate the utility, change the alignment and grade of the trench or as a last resort, declare the conflict as "extra work" to be accomplished by the Contractor in accordance with Section 104.

601.3.2 Irrigation Ditches, Pipes and Structures: The Contractor shall contact the owners of all irrigation facilities, and make arrangements for necessary construction clearances and/or dry-up periods.

All irrigation ditches, dikes, headgates, pipe, valves, checks, etc., damaged or removed by the Contractor, shall be restored to their original condition or better, by the Contractor at no additional cost to the Contracting Agency.

601.3.3 Building, Foundations and Structures: Where trenches are located adjacent to building, foundations, and structures, the Contractor shall take all necessary precaution against damage to them. The Contractor shall be liable for any damage caused by the construction.

Except where authorized in the special provisions or in writing by the Engineer, water settling of backfill material in trenches adjacent to structures will not be permitted.

601.3.4 Permanent Pipe Supports: Permanent pipe supports for the various types and sizes of sewer, water and utility lines shall conform to the Standard Details or the details shown on the plans. Such pipe supports shall be erected at the locations shown on the plans and/or at any other locations as necessary as determined by the Engineer.

601.3.5 Electronic, Telephonic, Telegraphic, Electrical, Oil and Gas Lines: These underground facilities shall be adequately supported by the Contractor. Support for plastic pipes shall be continuous along the bottom of the pipe. Support for metal pipe and electrical conduit may be continuous or nylon webbing may be used for suspension at no greater than ten-foot intervals.

The Contractor shall avoid damaging the plastic pipe, pipeways or conduits during trench backfilling and during foundation and bedding placement.

There will be no measurement or payment for this work. The Contractor will include all associated costs in the unit bid price for the conduit installation.

601.4 FOUNDATION, BEDDING, BACKFILLING AND COMPACTION:

601.4.1 Foundation: The material upon which the conduit or structure is to be placed shall be accurately finished to the grade or dimensions shown on the plans or as directed by the Engineer. The bottom portion of the trench shall be brought to grade so that the conduit or structure will be continuously in contact with the material on which it is being placed. If rocky or unsuitable soil is encountered, Subsection 601.2.5 applies.

601.4.2 Bedding: Bedding shall consist of granular material containing no pieces larger than 1 1/2 inches and free of broken concrete, broken pavement, wood or other deleterious material. Open graded rock will not be used without the written approval of the Engineer.

Recycled or reclaimed asphalt concrete shall not be used.

Where water consolidation is used, bedding for conduits, 24 inches or less in I.D., may be placed in one lift. For larger conduits the first lift shall not exceed the springline of the pipe.

Where mechanical compaction is used, the moisture content shall be such that the specified compaction can be obtained. The first lift shall be 8 inches or two-thirds of the distance to the springline whichever is greater. Succeeding lifts shall not exceed 2 feet loose and extreme care will be taken to prevent damage to or movement of the conduit by the compaction equipment.

601.4.3 Backfill: Backfill shall be sound earthen material free from broken concrete, broken pavement, wood or other deleterious material. Unless otherwise specified, this may be native material with no piece larger than 4 inches, select material or aggregate base course. Backfill under street pavement shall be constructed per Detail 200 with the type of replacement noted on the plans

Recycled or reclaimed asphalt concrete shall not be used.

or in the special provisions. Unless otherwise noted, backfill under single curb, curb and gutter, sidewalk, driveways, valley gutters, etc. shall be the same as the adjacent street pavement.

Utilities installed within a future roadway prism or within an unsurfaced alley shall be in accordance with Type E of Standard Detail 200 or as indicated in the Contracting Agency Special Provisions or as indicated on the plans.

Where water consolidation is used, backfill will be placed in lifts as required in the following table prior to settlement.

Trench Width	Backfill Lifts
18″ to 24″	Not to exceed 4′
25″ to 36″	Not to exceed 6′
Over 36″	Not to exceed 8′

The above backfill lift limitations are not applicable when water saturation is done by the jetting method.

Where mechanical compaction is used, backfill shall be placed in lifts the height of which shall not exceed that which can be effectively compacted depending on the type of material, type of equipment and methods used, and under no circumstances shall exceed 4 feet.

Backfill, around utilities that are exposed during trench excavation, shall be placed in accordance with the bedding methods.

601.4.4 Compaction Densities: Unless otherwise provided in the plans and/or special provisions, the trench backfill shall be thoroughly compacted to not less than the densities in Table 601-2 when tested and determined by AASHTO T-99 and T-191 or ASTM D-2922 and D-3017. When AASHTO T-99, method A or B, and T-191 are used for density determination, MAG Detail 190 will be used for rock correction.

The density required will depend on the Type shown on the plans and/or called for in the special provisions. Density required for each type shall comply to Table 601-2.

TABLE 601-2

MINIMUM TRENCH COMPACTION DENSITIES

Backfill Type	Location	From Surface To 2 feet Below Surface	From 2 feet Below Surface To 1 foot Above Top of Pipe	From 1 foot Above Top of Pipe to Bottom of Trench
I	Under any existing or proposed pavement, curb, gutter, sidewalk, or such construction included in the contract, or when any part of the trench excavation is within 2′ of the above.	100% for granular 95% for non-granular	90%	90%
II	On any utility easement street, road or alley right-of-way outside limits of (I).	85%	85%	90%
III	Around any structures or exposed utilities.	95% in all cases		

Note: The type required will generally be shown on the plans and the plans will govern. Where no type is shown on the plans the type shall comply with Table 601-2.

A consideration in determining the backfill Types as shown on the plans, is based on the trench widths as shown in the Contract Documents. If these trench widths increase beyond those widths referred to above and fall within the 2-foot limit of paved surfaces and other improvements due to construction exigencies, the backfill designation for that portion within the 2-foot limit of such improvements shall be Type I even though Type II backfill is shown on the plans.

City of Apache Junction

Below are the special provisions needed by Apache Junction when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. Apache Junction Detail G-3200 is very similar to pre-2002 MAG Detail 200. It is recommended that this detail be eliminated in lieu of the proposed changes to the MAG detail. Clarifications can be included in Apache Junction's Engineering Design Guidelines and Policies Manual.

- The following is required for all utilities to be installed under existing pavement.
  - Use Type B-Modified repairs per MAG Detail 200.
  - Remove and replace an additional 12" width of pavement on both sides of trench.
  - Trench base and backfill shall be 1-sack CLSM in accordance with MAG 728.
  - Asphalt concrete shall be a single course of A12.5-mm per EVAC, 2-inch minimum thickness or match existing, whichever is greater.
- Use Type B repairs for trenches that are not parallel to the center line of the street. Otherwise, use Type B-Modified trench repairs. Base and backfill shall be aggregate base course (ABC) per MAG Sections 702 and 601.
- Trench base and backfill shall be 1-sack CLSM in accordance with MAG 728 for all trenches under pavement and wash crossings.
- Replacement shall match existing pavement thickness and gradation. Minimum 2-inch thickness for single course pavements. Maximum 1-inch thickness of surface course over adequate base course to match existing thickness with two-course pavements.

Replace Apache Junction's Engineering Design Guidelines and Policies Manual Sections 2.15(I) and 2.16(D) with the following:

- Trench backfill, pavement and surface replacement shall be done in accordance with MAG Section 336 and Detail 200, except as noted herein.

The Apache Junction detail also includes a trench plating cross section. MAG Detail 211 incorporates more specific information. An exception to this detail can be included in Apache Junction's Engineering Design Guidelines and Policies Manual noting the following:

- Trench steel plating shall be done in accordance with MAG Detail 211. Place bump signs at all steel plate crossings.

City of Avondale

There are no additional special provisions needed by Avondale when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. Avondale does not have a separate standard detail for pavement repair. Unless otherwise discussed, exceptions presently noted are compatible with the proposed revisions.

Clarifications to pavement replacement requirements are included in the Avondale Engineering Department document titled "Construction Permit Special Provisions For Utility Work" dated September, 2005. It is recommended that the first sentence in Note 12 be revised as follows to be consistent with proposed revision language:

> Pavement replacement for open cut trenching, transverse and longitudinal, in any existing paved street, shall be in accordance with MAG Detail No. 200, Type B~~, with "T" Top construction.~~

City of Chandler

Below are the special provisions needed by Chandler when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. These requirements can be included in Chandler Specification No. 3 in the City of Chandler Standard Specifications in lieu of Detail C-110.

- Use Type B repairs per MAG Detail 200 for all utility trenches, with remnant removal as noted in detail for Type A trench repair.
- Trench backfill shall be ½-sack CLSM in accordance with MAG 728.
- For large excavations, the City Engineer may allow full depth ABC (MAG 702.2) compacted in accordance with MAG Table 601-2 (Type 1 backfill) at trench backfill instead of ½-sack CLSM.
- Base shall be aggregate base course (ABC) per MAG 702.2 compacted in accordance with MAG Table 601-2 and placed in maximum 8 inch lift thicknesses.
- Place backfill and compact shelf area prior to placing base course.
- For trenches in arterial, collector and industrial streets:
  - Base course thickness shall be increased from 12” to 16”
  - Remove and replace an additional 12” width of pavement on both sides of trench
  - Asphalt concrete base course shall be 2-1/2” thick A19-mm per EVAC
  - Asphalt concrete surface course shall be 1-1/2” thick A12.5-mm per EVAC
- For trenches in all other streets, pavement section shall be 2-1/2” thick A19-mm per EVAC.
- Where patches are located in streets surfaced with rubberized asphalt, a rubberized asphalt mix design shall be submitted to the City Engineer for approval prior to installation.

Town of Gilbert

Below are the special provisions needed by Gilbert when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. These requirements can be added to the specifications already noted in Section 4.7 titled “Trenching/Backfill Standards” in the Town of Gilbert Public Works and Engineering Standards and Details in lieu of Detail 45 (note: Gilbert may need to retain the part of Detail 45 that pertains to manhole adjustments).

- Trench backfill, pavement and surface replacement shall be done in accordance with MAG Section 336 and Detail 200, except as noted herein.
- Full depth 1-sack CLSM per MAG Section 728 may be used in lieu of compacted native backfill with Town Engineer’s approval.
- For transverse trenches, base course under pavement shall be Class “B” concrete per MAG Section 725. Concrete shall at least match existing base course thickness, but not be less than 8-inches in depth and shall extend a minimum of 6 inches beyond the trench width on each side.
- 1-sack CLSM per MAG Section 728 shall be used as base in lieu of Class “B” concrete if 1-sack CLSM is used as trench backfill.
- Pavement section shall match existing pavement, but not be less than 4 inches in thickness and be placed in two lifts using a surface and base course mix per East Valley Asphalt Committee recommendations. Pavement replacement shall extend a minimum of 12 inches beyond the base course width on each side.

Revise the second paragraph in 4.7 as follows (details note bedding, not trenching and backfill):

> Town of Gilbert Standard Details for *bedding* ~~trenching and backfill~~ are shown in the following illustrations in:

The following additional recommendations are also offered for consideration:

- Revise use of a Class B concrete cap over utility trenches backfilled with native soil to allow aggregate base course that is more compatible with the adjacent soil modulus. High elastic modulus differences between subgrade elements can result in differential settlement and subsequent pavement cracking.
- The backfill notes in Gilbert Details 84, 85, 86 & 87 reference compaction in accordance with MAG 601. Table 601-2 in the MAG section is not in agreement with the compaction requirements of Gilbert’s special provisions in the first paragraph in Section 4.7 (MAG requires 90% to within 2 feet of subgrade, Gilbert requires 90% to within 3 feet of subgrade plus includes optimum moisture guidelines). Suggest that the details reference Town of Gilbert special provisions and delete MAG reference.

City of Glendale

There are no additional special provisions needed by Glendale when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. Proposed changes include all requirements in Glendale Standard Detail G-319, thus allowing removal of this detail

The following additional recommendations are also offered for consideration:

- Glendale's Engineering Design and Construction Standards provide foundation, bedding and backfill material and compaction requirements for all wet utilities in the applicable technical design requirements, but do not include similar requirements for dry utilities. It is suggested that base and backfill material options be included in this document for dry utilities (foundation and bedding are typically done in accordance with the dry utility's standards). Either MAG Section 601 compaction requirements can be used (without exception taken) or additional compaction requirements will be needed in these Glendale standards.

City of Goodyear

Below are the special provisions needed by Goodyear when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. Goodyear Detail G-3200 is very similar to pre-2002 MAG Detail 200. It is recommended that this detail be eliminated in lieu of the proposed changes to the MAG detail. Backfill and base material clarifications can be included in Goodyear's Engineering Design Standards and Policy Manual.

- Trench backfill, pavement and surface replacement shall be done in accordance with MAG Section 336 and Detail 200, except as noted herein.
- For Type B and B-Modified trench repairs, base and backfill shall be aggregate base course (ABC) per MAG Sections 702 and 601.

Maricopa County Department of Transportation

There are no additional special provisions needed by MCDOT when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. MCDOT does not have a separate standard detail for pavement repair. Exceptions presently noted are compatible with the proposed revisions.

City of Mesa

Below are the special provisions needed by Mesa when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. These requirements can be included in Section S of Mesa Standard Specifications in lieu of Details M-19.4, sheet 1 of 2 and Detail M-19.5.

- Trench backfill, pavement and surface replacement shall be done in accordance with MAG Section 336 and Detail 200, except as noted herein.
- Remnant removal as noted in detail for Type A trench repair shall be 36 inches.
- For Type A trench repairs, base shall be aggregate base course (ABC) per MAG 702.2. Trench backfill and bedding shall be either granular material or non-granular native material per MAG 601 and 702.
- For Type A trench repairs, asphalt concrete base course width shall match the trench width.
- For Type B trench repairs, base shall be either aggregate base course (ABC) per MAG 702.2 or 1-sack CLSM in accordance with MAG 728. Trench backfill and utility bedding shall be 1-sack CLSM in accordance with MAG 728.
- Compaction shall be in accordance modified Table 601-2 as shown in Section W.
- Measurement for payment shall be per MAG Section 336.4 except for pay width. All pay widths shall be computed per Section 336.4 and shall be only for the trench width as shown in MAG Detail 200, unless otherwise noted on the plans or special provisions. Note: No payment will be made for additional pavement replacement as a result of a wider trench excavation.

Detail M-19.4, sheet 2 of 2 can be deleted, with notes incorporated in Mesa Standard Specs:

- Notes 1, 3, 4, 8 and 10 can be placed in Section S.
- Note 2 is already in Section W.
- Notes 5 and 7 are incorporated with the exceptions shown above.
- Note 6 is already in Section S.
- Note 9 is not an exception to any MAG requirement (if determined as necessary, could be placed in Section S).
- Note 11 can be placed in Section W.

Modified Table 601-2 (to be placed in Section W of Mesa Standard Specifications):

MINIMUM TRENCH COMPACTION DENSITIES				
Backfill Type	Location	From Surface to 2' Below Surface	From 2' Below Surface to 1' Above top of Pipe	From 1' Above Top of Pipe to Bottom of Trench
I	Under any existing or proposed pavement, curb, gutter, sidewalk, or such construction included in the contract, or when any part of the trench excavation is within 2' of the above, or within future or new roadway prisms and alleys.	Granular: 100% Non-Granular: 95%	Granular: 100% Non-Granular: 95% (1)	Granular: 100% Non-Granular: 95%
II	On utility easement in street or road right-of-way outside limits of I.	85%	85%	90%
III	Around any structure or exposed utilities.	95% in all cases		

(1) 90% for trenches within future or new roadway prisms and alleys

City of Peoria

There are no additional special provisions needed by Peoria when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. Peoria does not have a separate standard detail for pavement repair. Unless otherwise discussed, exceptions presently noted are compatible with the proposed revisions.

It is recommended that Note 3 of the section titled “Trench Backfill and Pavement Replacement” in City of Peoria Engineering Memorandum titled “Utilities/Contractors/Subcontractors Requesting to Work in the City of Peoria Right-of-way,” dated February 25, 2002, be revised as follows:

3. Pavement thickness shall be 1.5 times the existing thickness. Pavement shall be replaced per M.A.G. Standard Detail 200 *Type B* ~~(“T-top”)~~ with the exception that all backfill shall be ½ sack *CLSM in accordance with MAG 728* ~~ABC slurry~~.

City of Phoenix

Below are the modifications to special provisions needed by Phoenix when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. These modifications can be done in the City of Phoenix Supplement to MAG Section 336 in lieu of Detail P1200.

It is recommended that Phoenix Supplement Section 336.3 be revised as follows:

Normally, the type of pavement replacement and backfill required for the trench excavation will be noted on the plans or specified in the special provisions and construction will be in accordance with *MAG Detail 200.* ~~City of Phoenix Supplement to MAG Detail P-1200~~.

For trenches up to 24 inches wide, CLSM may be used up to the replacement pavement subgrade level. For trenches between 24 inches and 6 feet wide, CLSM shall only be placed in the top 24 inches of trench. For trenches wider than 6 feet, CLSM backfill shall not be used. CLSM shall be ½-sack cement in accordance with MAG 728

(A) Unless otherwise specified, *MAG Detail 200, Type B transverse trench repairs* ~~the "T" top as shown in City of Phoenix Supplement to MAG Specs Detail P-1200~~ will not be required within the City of Phoenix. If the project extends into another municipality/county *Type B* t~~he "T" top~~ may be required for that portion of the project. *Base and backfill for Type B shall be either aggregate base course (ABC) per MAG 702.2 or 1/2-sack CLSM in accordance with MAG 728.*

(B) When the trench excavation is not being accomplished in conjunction with a paving project, the following backfill and pavement replacement requirements apply:

(1) Use Type B-Modified repairs per MAG Detail 200.

(*2*~~1~~) When the trench is transverse (45 to 90 degrees to street centerline) *or when a longitudinal trench crosses a major street, collector street or any other signalized intersection,* ~~the backfill material required by Detail P-1200 for Type B shall be used.~~ *base and backfill shall be either aggregate base course (ABC) per MAG 702.2 or 1/2-sack CLSM in accordance with MAG 728.* Permanent trench pavement replacement is required.

(*3*~~2~~) When the trench is parallel or less than 45 degrees to the street centerline, ~~the backfill material required by Detail P-1200 for Type A shall be used.~~ *base and backfill shall be aggregate base course (ABC), granular material or native soil per MAG 702 and 601, or 1/2-sack CLSM in accordance with MAG 728.* Permanent trench pavement replacement is required.

~~(3) When the trench crosses a major street, collector street, or any other signalized intersection, the backfill materials required by Detail P-1200 for Type B shall be used. Permanent trench pavement replacement is required~~.

(C) When the trench excavation is being accomplished in conjunction with a paving project ~~the following backfill and pavement replacement requirements apply:~~ *permanent pavement replacement is not required.*

~~(1) When the trench is transverse (45 to 90 degrees to street centerline) the backfill material required by Detail P-1200 for Type B will be used. Permanent pavement replacement is not required.~~

~~(2) When the trench is parallel or less than 45 degrees to the street centerline, the backfill material required by Detail P-1200 for Type A shall be used. Permanent trench pavement replacement is not required.~~

~~3) When the trench crosses a major street, collector street, or any other signalized intersection, the backfill material required by Detail P-1200 for Type B shall be used. Permanent trench pavement replacement is not required~~.

~~(4)~~ Temporary pavement replacement (MAG 336.2.3) will be required at intersections for traffic control and at existing partial paved areas when the total pavement is not scheduled for immediate removal and replacement. In addition to the above, the Engineer may require temporary pavement at any area where public safety and welfare warrants. This will be a non-pay item considered incidental to the project.

~~(5)~~ If the excavation extends beyond the limits of the paving project, the Contractor shall provide permanent trench pavement replacement in accordance with paragraph (B) for this extension.

(D) *Use Type C repairs per MAG Detail 200* ~~W~~*w*hen the trench excavation is made in Portland cement concrete pavement, ~~Detail P-1200 Type C backfill and pavement replacement applies~~.

(E) When the condition of the existing pavement does not justify the use of *MAG Detail 200* ~~Detail P-1200, Type A or~~ Type B*-Modified repairs* ~~backfill~~, Type D backfill and pavement replacement shall apply. *Backfill shall be compacted native soil.* Written approval from the Engineer shall be required.

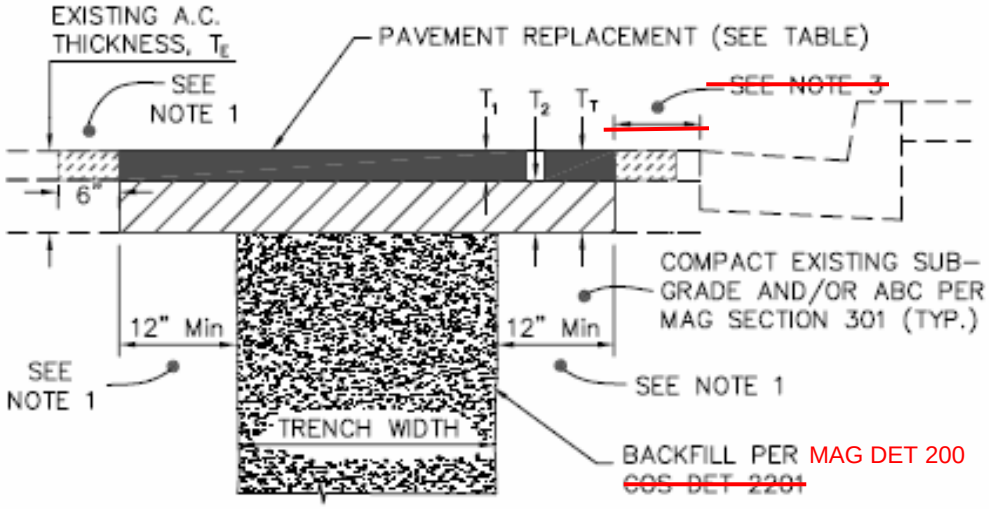
(F) When the trench excavation is made in ABC or decomposed granite pavement, *MAG Detail 200* ~~Detail P-1200~~ Type ~~E~~ *D* backfill and pavement replacement shall apply. *Backfill shall be compacted native soil (no base required). Surfacing replacement shall be at least 4 inches thick.*

City of Scottsdale

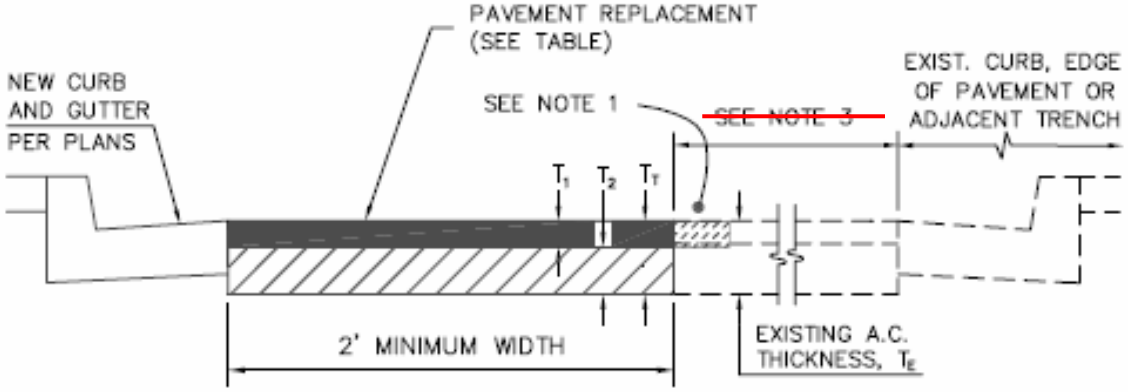
Below are the modifications to special provisions needed by Scottsdale when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. These modifications can be done in the City of Scottsdale Supplement to MAG Section 336 in lieu of COS Detail 2201. COS Detail 2000 includes extensive pavement section replacement requirements and should be modified (as attached) to delete duplication of trenching requirements in proposed MAG Detail 200.

- Trench backfill, pavement and surface replacement shall be done in accordance with MAG Section 336 and Detail 200, except as noted herein.
- Use Type A repairs per MAG Detail 200 as modified below for all utility trenches under existing and future pavement.
- Any pavement remnant 36 inches or less in width between edge of pavement replacement and existing curb, edge or pavement or edge of existing adjacent trench cut shall be removed and replaced.
- When specified as backfill, use ½ -sack CLSM in accordance with MAG 728.
- Unless otherwise specified, base layer shall be aggregate base course (ABC) per MAG 702.2.
- Trench backfill for Type A repairs shall be as follows:
    a) Trenches less than 24 inches in width shall be backfilled from bedding to the bottom of the base layer with CLSM or to 6 inches below pavement in full depth pavement.
    b) Trenches 24 inches to 6 feet in width shall be backfilled from bedding to the bottom of the base layer with either granular material or non-granular native material per MAG 601.4.3. Base layer shall be CLSM.
    c) Trenches over 6 feet in width shall be backfilled with either granular material or non-granular native material per MAG 601.4.3.
- Use Type D repairs per MAG Detail 200 for all utility trenches under unpaved roadways, parking lots and vacant land. If ABC base layer is present, place a minimum 12-inch thickness. Backfill shall be either granular material or non-granular native material per MAG 601.4.3.
- For all unpaved roadways, lots and alleys, treat the entire disturbed surface with lignin-based dust palliative in accordance with MAG 792, 1:1 dilution ratio, 0.50 gal/sy application rate.
- Bedding shall be per MAG Detail 200 as modified by COS Supplemental Specification Section 601.4.2. CSLM shall not be used as bedding for water or sewer pipe.
- Bedding for HDPE pipe shall be per COS Supplemental Specification Section 603.4.2.

It is recommended that Scottsdale Supplement Section 336.2.4 be deleted as this paragraph has been included in revisions to MAG Section 336.



PAVEMENT REPLACEMENT FOR TRENCHES (T-TOP)



PAVEMENT REPLACEMENT

EXISTING PAVEMENT THICKNESS, T_E	AC PAVEMENT REPLACEMENT TABLE		
	AC SINGLE COURSE OR SURFACE COURSE, T_1	AC BASE COURSE, T_2	TOTAL THICKNESS, T_T
$T_E \leq 3"$	3" MINIMUM	NONE	3" MINIMUM
$T_E > 3"$	2" MINIMUM	2" MINIMUM	T_E (MATCH EXIST)

PAVEMENT REPLACEMENT NOTES

1. "T"-TOP REQUIRED FOR ALL TRENCHES. A.C. SURFACE COURSE REPLACEMENT TO BE MILLED DOUBLE "T" CONFIGURATION AS SPECIFIED BELOW FOR PAVEMENTS 4" AND THICKER.
   a. FOR PAVEMENT 4 YEARS AND OLDER: INITIAL A.C. REMOVAL TO BE THE MINIMUM WIDTH REQUIRED FOR PROPER TRENCH COMPACTION. SAWCUT & REMOVE 12" OF A.C. MINIMUM ON EACH SIDE OF THE TRENCH FOR THE "T"-TOP AFTER THE BACKFILL MATERIAL IS PLACED. PAVEMENTS 4" AND THICKER, MILL AND REMOVE THE TOP 2" OF THE SURFACE COURSE A MINIMUM OF 6" ON EACH SIDE OF THE T-TOP PRIOR TO PLACEMENT OF THE FINAL SURFACE COURSE LIFT.
   b. FOR NEW AND OVERLAYED PAVEMENT LESS THAN 4 YEARS OLD AND WHEN ALLOWED UNDER THE PROVISIONS OF SCOTTSDALE REVISED CODE SECTIONS 47-79 AND ALL PAVEMENTS WITH RUBBERIZED SURFACE COURSES: INITIAL A.C. REMOVAL TO BE THE MINIMUM WIDTH REQUIRED FOR PROPER TRENCH COMPACTION. SAWCUT & REMOVE 12" OF A.C. MINIMUM ON EACH SIDE OF THE TRENCH FOR THE "T"-TOP AFTER THE BACKFILL MATERIAL IS PLACED. PAVEMENTS 4" AND THICKER, MILL AND REMOVE THE TOP 2" OF THE SURFACE COURSE EQUALLY ON BOTH SIDES OF THE TRENCH TO A MINIMUM TOTAL WIDTH OF 10 FEET. FOR PAVEMENTS LESS THAN 4" THICK SAWCUT, REMOVE AND REPLACE THE ENTIRE PAVEMENT SURFACE TO A MINIMUM TOTAL WIDTH OF 10 FEET, AS DIRECTED BY THE ENGINEER.
   c. FOR DEEP PAVEMENT STRUCTURES REQUIRING TWO OR MORE PAVEMENT BASE LIFTS: INITIAL A.C. REMOVAL TO BE THE MINIMUM WIDTH REQUIRED FOR PROPER TRENCH COMPACTION. SAWCUT, REMOVE AND REPLACE A.C. ON BOTH SIDES OF THE TRENCH AS NECESSARY TO ACCOMODATE A RIDE ON TYPE VIBRATORY ROLLER COMPACTOR FOR PLACEMENT OF THE A.C. BASE COURSE LIFTS, MATCH EXISTING A.C. DEPTH. MILL AND REMOVE THE TOP 2" OF THE SURFACE COURSE EQUALLY ON BOTH SIDES OF THE TRENCH TO A MINIMUM TOTAL WIDTH OF 10 FEET.
2. ~~ASPHALT CONCRETE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF MAG SECTION 321.~~
3. ~~IF PAVEMENT REMNANT IS LESS THAN 36", REMOVE AND REPLACE PAVEMENT AS PER THIS DETAIL.~~
4. ~~AGGREGATE BASE COURSE PER MAG SECTION 702 SHALL BE PROVIDED TO MATCH EXISTING ABC THICKNESS IN ADJACENT ROADWAY.~~
5. ~~REFER TO COS SUPPLEMENTAL SPECIFICATIONS, SECTION 336.2.4 FOR PAVEMENT SMOOTHNESS REQUIREMENTS.~~

REVISED 7/15/03

DETAIL NO. 2200 | City of Scottsdale Standard Details | PAVEMENT REPLACEMENT | DETAIL NO. 2200

2. EXCEPT AS REVISED ABOVE, PAVEMENT MATCHING AND SURFACE REPLACEMENT SHALL BE IN ACCORDANCE WITH MAG 336.

City of Tempe

Below are the special provisions needed by Tempe when using proposed MAG Detail 200, revised MAG Section 336 and existing MAG Section 601. These modifications can be done in the City of Tempe Supplements to MAG Standard Specifications in lieu of COT Detail T-450.

- Trench backfill, pavement and surface replacement shall be done in accordance with MAG Section 336 and Detail 200, except as noted herein.
- When specified as backfill, use ½ -sack CLSM in accordance with MAG 728.
- Use Type A repairs per MAG Detail 200 as modified below for longitudinal trenches.
    a) Base layer shall be aggregate base course per MAG 702.2 at least 12 inches in depth or matching existing, whichever is greater.
    b) Backfill shall be CLSM from top of bedding to the bottom of the base layer.
- Use Type A repairs per MAG Detail 200 as modified below for transverse trenches.
    a) Base and backfill shall be CLSM from top of bedding to the bottom of the pavement section.
- Sawcut and remove asphalt concrete pavement to match trench width.
- Asphalt concrete base course thickness and type shall be as described in COT Details T-311, T-312, T-313, T-314, T-315, T-316 and T-317, or match existing pavement thickness, whichever is greater.
- After completion of trench backfill and base course pavement replacement, sawcut asphalt concrete 2 inches deep at an additional 12-inch distance parallel to and on both sides of trench cut. Rotomill and remove asphalt concrete 2 inches deep between sawcuts. Place by laydown machine new 2-inch thick A12.5-mm asphalt concrete surface course.
- Use of steel plates (per MAG Detail 211) shall not exceed 72 hours prior to final pavement placement.

It is recommended that Tempe adopt MAG 728 Controlled Low Strength Material in lieu of Lean Mix Backfill specified in COT Detail T-450.

Pavement Replacement Standards by MAG Agencies

Agency	AC Standard	AC Thickness and Type (by street type)					
		Arterial/Major Collector		Industrial		Local/Residential/Minor Collector	
		AC Base Course	AC Surface Course	AC Base Course	AC Surface Course	AC Base Course	AC Surface Course
MAG standards	MAG	For all street types: Match existing pavement thickness, 2" min. 12.5-mm or 19-mm for single course, 1" max. 9.5-mm surface course over 2" min. 19-mm base course with two-course pavements					
Apache Junction	EVAC	For all street types: Match existing pavement thickness, 2-½" min. 12.5-mm for single course, 1" max. surface course over 2" min base course with two-course pavements					
Avondale	Superpave & COP	3" min, 19-mm	2" 12.5-mm	-----	-----	3" 19-mm or 3" C-3/4" COP	-----
Chandler	EVAC	2-½", A19-mm	1-½", A12.5-mm	2-½", A19-mm	1-½", A12.5-mm	2-½", A12.5-mm	-----
Gilbert	EVAC	For all street types: Match existing pavement with two-course pavement, minimum 4" total thickness					
Glendale	Superpave	For all street types: Match existing pavement thickness with 9.5-mm or 12.5-mm AC, maximum 2-½" lifts					
Goodyear	MAG	(same as MAG standards)					
MCDOT	MAG	(same as MAG standards)					
Mesa [1]	EVAC	4" min, A19-mm	(See Note 1)	3" min, A19-mm	(See Note 1)	2-½" min, R25-mm	(See Note 1)
Peoria	MAG	For all street types: 1.5 times existing pavement thickness					
Phoenix	MAG & COP	For all street types: In accordance with plans or special provisions					
Scottsdale [2]	EVAC	For all street types: If existing pavement is ≤ 3", place 3" min AC thickness, match existing type If existing pavement is > 3" place 2" min AC base course under 2" AC surface course, match existing types/thickness					
Tempe [3] [4]	EVAC	4" min, A25-mm	2", A12.5-mm	4" min, A25-mm	2", A12.5-mm	2-½" min, R19-mm	-----

[1] After full depth AC base course patch has been subjected to traffic 2-3 weeks, mill out 1½" & place R12.5 or A12.5 AC surface course

[2] Pavements 4" and thicker, mill & remove upper 2" prior to final placement of surface course – width varies with pavement age

[3] Multi-family & Residential Collectors – Place 3" min A19 base course under 2" A12.5 surface course

[4] Rotomill & remove upper 2" prior to final placement of surface course